

What is claimed:

1. A vacuum processing apparatus comprising:

a cassette table for mounting at least one cassette on a plane, each cassette capable of storing at least a dummy sample in the atmosphere;

a load lock chamber for storing said dummy sample and changing-over from the atmosphere to the vacuum condition, or from the vacuum condition to the atmosphere;

a first transferring device having an extensible arm capable of vertical operation and rotatable operation and a scooping device for taking out said dummy sample from any one of a plurality of cassettes, and transferring it to said load lock chamber or transferring it from said load lock chamber to said one cassette;

a transferring chamber for transferring said dummy sample in a vacuum condition;

a plurality of vacuum processing chambers connected to said transferring chamber through a gate valve to process said dummy sample one by one in a vacuum condition;

a second transferring device arranged in said transferring chamber, having an extensible arm capable of rotatable operation, for transferring said dummy sample between said load lock chamber and said plurality of vacuum processing chambers;

a first support member arranged in said load lock chamber so as to support said dummy sample one by one;

a second support member arranged in each of said plurality of processing chambers so as to support said dummy sample one by one;

a first sample lifting mechanism capable of moving up or moving down said first supporting member so as to transfer said dummy sample to said second transferring device, and a second sample lifting mechanism arranged at said second support member in each of said processing chambers; and
a controller for controlling

(a) receiving of said dummy sample on said scooping-up device of said first transferring device by inserting said scooping-up device of said first transferring device under a bottom surface of said dummy sample to be taken out of said one cassette and by lifting said scooping-up device,

(b) transferring of said dummy sample received on said scooping-up device of said first transferring device to said first support member by said first transferring device,

(c) transferring of said dummy sample to said second transferring device by operating said first sample lifting mechanism,

(d) transferring of said dummy sample by said second transferring device to said second support member in any one of said processing chambers and transferring of said dummy sample to said second support member by operating the second sample lifting mechanism, and

(e) processing of said dummy sample in said processing chamber.

2. The vacuum processing apparatus according to claim 1,

wherein the apparatus comprises a detecting device for detecting a position of said dummy sample and

said controller controls each of said controlling operations (a)-(e) under application of an output from said detecting device.

3. The vacuum processing apparatus according to claim 1, wherein said load lock chamber comprises a load side load lock chamber for transferring said dummy sample from the atmosphere to the vacuum, and an unload side load lock chamber for transferring said dummy sample from the vacuum to the atmosphere, wherein a plurality of said first support members is provided, and each of said plurality of first support members is arranged in each of said load side load lock chamber and unload side load lock chamber.

4. The vacuum processing apparatus according to claim 1, wherein said dummy sample is used for checking for a number of foreign particles.

5. The vacuum processing apparatus according to claim 1, wherein said dummy sample is used for a cleaning process of said processing chamber.

6. The vacuum processing apparatus according to claim 1, wherein said cassette table enables mounting of a plurality of cassettes on a plane.

7. A method for processing a dummy sample with a vacuum processing apparatus, wherein

said vacuum processing apparatus includes a cassette table for mounting, in the atmosphere, a plurality of cassettes, each cassette capable of storing at least a dummy sample; a first transferring device having an extensible arm capable of vertical operation and rotatable operation and a scooping device for taking out said dummy sample from any one of a plurality

of cassettes, and transferring it to said load lock chamber or transferring it from said load lock chamber to said one cassette; a load lock chamber having a first support member for storing said dummy sample and changing over from the atmosphere to vacuum condition or from the vacuum condition to the atmosphere; a first sample lifting mechanism provided in said load lock chamber enabling said first support member to be moved up or down for transferring said dummy sample between said first support member supporting said dummy sample one by one and said second transferring device; a transferring chamber for transferring said dummy sample under a vacuum condition; a second transferring device arranged in said transferring chamber; a plurality of processing chambers connected to said transferring chamber through a gate valve so as to process said dummy sample one by one in vacuum; a second support member for supporting said dummy sample one by one and a second sample lifting mechanism arranged at said second support member installed within each of said processing chambers; and a controller,

wherein said method comprises steps of:

- (a) receiving said dummy sample on said scooping-up device by inserting said scooping-up device of said first transferring device under a bottom surface of said dummy sample to be taken out of any one of said plurality of said cassette, and by lifting said scooping device,
- (b) transferring said dummy sample received on said scooping-up device of said first transferring device to said first support member by said first transferring device,
- (c) transferring said dummy sample to said second transferring

device by operating said first sample lifting mechanism,

(d) transferring said dummy sample to said second support member in any one of said processing chambers by said second transferring device and transferring said dummy sample to said second support member by operating the second sample lifting mechanism, and

(e) processing said dummy sample in said processing chamber.

8. The method for processing a dummy sample with a vacuum processing apparatus according to claim 7,

wherein the apparatus comprises a detecting device for detecting a position of said dummy sample and

each of said steps (a) - (e) is carried out under application of an output of said detecting device.

9. The method for processing a dummy sample with a vacuum processing apparatus according to claims 7, said load lock chamber comprises a load side load lock chamber for transferring said dummy sample from the atmosphere to the vacuum, and an unload side load lock chamber for transferring said dummy sample from the vacuum to the atmosphere, wherein a plurality of said first support members is provided, and each of said plurality of first support members is arranged in each of said load side load lock chamber and unload side load lock chamber.

10. The method for processing a dummy sample with a vacuum processing apparatus according to claim 7, said dummy sample is used for

checking for a number of foreign particles.

11. The method for processing a dummy sample with a vacuum processing apparatus according to claim 7, said dummy sample is used for a cleaning process of said processing chamber.

12. A vacuum processing apparatus comprising:

a cassette table for mounting at least one cassette on a plane, each a cassette capable of storing at least a dummy sample in the atmosphere;

a load lock chamber for storing said dummy sample and changing-over from the atmosphere to the vacuum condition, or from the vacuum condition to the atmosphere;

a first transferring device having an extensible arm capable of vertical operation and rotatable operation and a scooping device for taking out said dummy sample from any one of a plurality of cassettes, and transferring it to said load lock chamber or transferring it from said load lock chamber to said one cassette;

a transferring chamber for transferring said dummy sample in a vacuum condition;

a plurality of vacuum processing chambers connected to said transferring chamber through a gate valve to process said dummy sample one by one in a vacuum condition;

a second transferring device arranged in said transferring chamber, having an extensible arm capable of rotatable operation, for transferring said dummy sample between said load lock chamber and said plurality of vacuum

processing chambers;

a first support member arranged in said load lock chamber so as to support said dummy sample one by one;

a second support member arranged in each of said plurality of processing chambers so as to support said dummy sample one by one;

a first sample lifting mechanism capable of effecting relative vertical movement between said first support member and said second transferring device so as to transfer said dummy sample between said first support member and said second transferring device; and

a second sample lifting mechanism capable of effecting relative vertical movement between said second support member and said second transferring device so as to transfer said dummy sample between said second support member and said second transferring device.

13. A method for processing a dummy sample with a vacuum processing apparatus, wherein

said vacuum processing apparatus includes a cassette table for mounting at least one cassette on a plane, each a cassette capable of storing at least a dummy sample in the atmosphere; a load lock chamber for storing said dummy sample and changing-over from the atmosphere to the vacuum condition, or from the vacuum condition to the atmosphere; a first transferring device having an extensible arm capable of vertical operation and rotatable operation and a scooping device for taking out said dummy sample from any one of a plurality of cassettes , and transferring it to said load lock chamber or transferring it from said load lock chamber to said one cassette; a transferring

chamber for transferring said dummy sample in a vacuum condition; a plurality of vacuum processing chambers connected to said transferring chamber through a gate valve to process said dummy sample one by one in a vacuum condition; a second transferring device arranged in said transferring chamber, having an extensible arm capable of rotatable operation, for transferring said dummy sample between said load lock chamber and said plurality of vacuum processing chambers; a first support member arranged in said load lock chamber so as to support said dummy sample one by one; a second support member arranged in each of said plurality of processing chambers so as to support said dummy sample one by one; a first sample lifting mechanism capable of effecting relative vertical movement between said first support member and said second transferring device so as to transfer said dummy sample between said first support member and said second transferring device; and a second sample lifting mechanism capable of effecting relative vertical movement between said second support member and said second transferring device so as to transfer said dummy sample between said second support member and said second transferring device,

wherein said method comprises the steps of:

(a) receiving said dummy sample on said extensible arm of said first transferring device by inserting said extensible arm of said first transferring device under a bottom surface of said dummy sample to be taken out of said at least one cassette, and by lifting said scooping device;

(b) transferring said dummy sample received on said extensible arm of said first transferring device to said first support member by said first transferring device,

(c) transferring said dummy sample to said second transferring device by inserting said extensible arm of said second transferring device under said dummy sample on said first support and operating said first sample lifting mechanism to effect relative vertical movement between said first support member and said second transferring device so as to transfer said dummy sample from said first support member to said second transferring device,

(d) transferring said dummy sample to said second support member in one of said processing chambers by moving said extensible arm of said second transferring device over said second support and operating said second sample lifting mechanism to effect relative vertical movement between said second support member and said second transferring device so as to transfer said dummy sample from said second transferring device to said second support member, and

(e) processing said dummy sample in said processing chamber.

14. A vacuum processing apparatus comprising:

a cassette table for mounting at least one cassette on a plane, each cassette capable of storing at least a dummy sample in the atmosphere;
a load lock chamber for storing said dummy sample and changing-over from the atmosphere to the vacuum condition, or from the vacuum condition to the atmosphere;

a first transferring device having an extensible arm capable of vertical operation and rotatable operation and a scooping device for taking out said dummy sample from any one of a plurality of cassettes, and transferring it to said load lock chamber or transferring it from said load lock chamber to said

one cassette;

a transferring chamber for transferring said dummy sample in a vacuum condition;

a plurality of vacuum processing chambers connected to said transferring chamber through a gate valve to process said dummy sample one by one in a vacuum condition;

a second transferring device arranged in said transferring chamber, having an extensible arm capable of rotatable operation, for transferring said dummy sample between said load lock chamber and one of said plurality of vacuum processing chambers;

a first support member arranged in said load lock chamber so as to support said dummy sample one by one;

a second support member arranged in each of said plurality of processing chambers so as to support said dummy sample one by one;

a first sample lifting mechanism capable of moving up or moving down said first support member so as to transfer said dummy sample to said second transferring device, and a second sample lifting mechanism arranged at said second support member in each of said processing chambers; and a controller for controlling

(a) receiving of said dummy sample on said scooping-up device of said first transferring device by inserting said scooping-up device of said first transferring device under a bottom surface of said dummy sample to be taken out of said one cassette and by lifting said scooping-up device,

(b) transferring of said dummy sample received on said scooping-up device of said first transferring device to said first support member by said

first transferring device,

(c) transferring of said dummy sample to said second transferring device by operating said first sample lifting mechanism,

(d) transferring of said dummy sample by said second transferring device to said second support member in any one of said processing chambers and transferring of said dummy sample to said second support member by operating the second sample lifting mechanism, and

(e) processing of said dummy sample in said processing chamber.

15. A method for processing a dummy sample with a vacuum processing apparatus, wherein

said vacuum processing apparatus includes a cassette table for mounting at least one cassette on a plane, each cassette capable of storing at least a dummy sample in the atmosphere; a load lock chamber for storing said dummy sample and changing-over from the atmosphere to the vacuum condition, or from the vacuum condition to the atmosphere; a first transferring device having an extensible arm capable of vertical operation and rotatable operation and a scooping device for taking out said dummy sample from any one of a plurality of cassettes, and transferring it to said load lock chamber or transferring it from said load lock chamber to said one cassette; a transferring chamber for transferring said dummy sample in a vacuum condition; a plurality of vacuum processing chambers connected to said transferring chamber through a gate valve to process said dummy sample one by one in a vacuum condition; a second transferring device arranged in said transferring chamber, having an extensible arm capable of rotatable operation, for

transferring said dummy sample between said load lock chamber and one of said plurality of vacuum processing chambers; a first support member arranged in said load lock chamber so as to support said dummy sample one by one; a second support member arranged in each of said plurality of processing chambers so as to support said dummy sample one by one; a first sample lifting mechanism capable of moving up or moving down said first support member so as to transfer said dummy sample to said second transferring device, and a second sample lifting mechanism arranged at said second support member in each of said processing chambers; and a controller,

wherein said method comprises the steps of:

(a) receiving said dummy sample on said scooping-up device of said first transferring device by inserting said scooping-up device of said first transferring device under a bottom surface of said dummy sample to be taken out of said one cassette and lifting said scooping-up device,

(b) transferring said dummy sample received on said scooping-up device of said first transferring device to said first support member by said first transferring device,

(c) transferring said dummy sample to said second transferring device by operating said first sample lifting mechanism,

(d) transferring said dummy sample by said second transferring device to said second support member in any one of said processing chambers by operating the second sample lifting mechanism, and

(e) processing said dummy sample in said processing chamber.